



Colorado Department
of Public Health
and Environment

Hazardous Materials and Waste Management Division

Rocky Flats Oversight Unit

Technical Report

Buffer Zone Contamination Review

*A Review of Information Related to Contamination
of the Rocky Flats Buffer Zone*

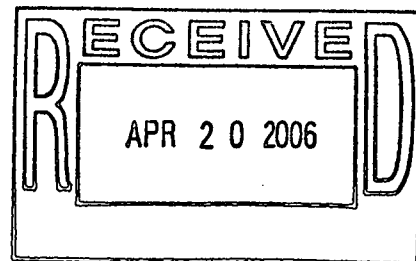
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ADMIN RECORD

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Purpose

This study was intended to be a review of information contained in various documents to ascertain if additional potentially contaminated areas might exist in the Buffer Zone, beyond those areas that have currently been identified as Potential Areas of Concern (PACs) or Individual Hazardous Substance Sites (IHSSs). Identification of additional areas of possible concern does not necessarily mean that these newly identified areas contain contamination or that they are necessarily the result of unreported activities performed at Rocky Flats. Rather these areas may be the result of natural events, or they may have been identified but the activities associated with these sites are not adequately documented at this time. Whereas the currently identified PACs and IHSSs are specifically studied or investigated by Rocky Flats, leading to a determination of "No Further Action" (NFA) or appropriate remediation.

Introduction

Upon closure of the Rocky Flats site, the Colorado Department of Public Health and Environment (CDPHE) will be required to affirm that potential contamination across the site has been addressed. Potentially contaminated areas were identified in the early 1990's and organized into Potential Areas of Concern (PACs) and Individual Hazardous Substance Sites (IHSSs) for future investigation. This report attempts to verify that all potential contamination is included in the designated PACs or IHSSs, so that CDPHE can confirm the adequacy of closure.

Various documents were reviewed during this study. These documents are listed in Appendix 1. A basic synopsis of the information gained from each document is provided in Appendix 2. Of the various documents that were reviewed, only the Aerial Photographic Analysis Comparison Report (Photo Report) appeared to identify additional possible areas of concern.

The process used was to identify areas of possible environmental concerns and determine whether:

- documentation exists showing the concerns to be unfounded,
- documentation exists showing the problem has been mitigated, or
- the area is included in a currently identified PAC or IHSS.

Thirty (30) additional areas that may have possible environmental concerns have been identified. These areas should have additional evaluations performed to determine if any of these areas need to be identified as IHSSs or PACs.

This study has also identified six (6) additional areas that are currently described as PACs and/or IHSSs, that appear to have further concerns needing evaluation.

The location of these 36 areas of possible concern are shown on Figure 2.

Findings

Additional areas of possible concern identified from the Photo Report were recorded on a list and a map of Rocky Flats (see Appendix 2 and Figure 1). These areas of interest included some of those specifically identified in the Photo Report as disturbed ground, disposal sites, etc, as well as other anomalous areas where unknown activities may have occurred.

The Historical Release Reports (HRRs) for 1992 and 1998 were then reviewed to determine if these areas of interest appear to have been identified (see Appendix 2). Those areas that were not identified in the HRRs, or that appeared to have a different aerial extent or location were retained for further discussion in this report.

A site visit was conducted on 2/25/99, the results of this site visit are provided in Appendix 3.

Based on the results of this study the following sites (see Figure 2) appear to have potential as new areas of possible environmental concern (IHSSs or PACs), which require documentation that no hazard exists, or may need further evaluations:

- 1) The disturbed ground, located immediately southeast of the Industrial Area (IA) has been identified as the former small arms firing range (see Appendix 2, #1 & 64). A visual inspection (see Appendix 3) found the area littered with junk/trash, used range equipment, and shell casings. Both the north and east embankments had been used for target practice, and should contain bullets, as would the area to the south (toward Woman Creek), which contained old metal target frames at various distances from the range. Weapons, including machine guns, appear to have been fired at these targets to the south, toward Woman Creek and the opposite hillside. This area may have concerns for metals contamination, as well as other contaminants such as explosives, VOCs (from weapons cleaning), and rads.
- 2) Disturbed ground northwest of the IA, an apparent ranch site (Lindsay Ranch), possible trenches, and an area along the hillside near the creek to the southwest of the ranch (see Appendix 2, #4, 41, & 49). This area is reported to have been utilized as a practice site for various activities, including small arms target practice, and possibly for disposal activities. As such, this area may have concerns for metals (at a minimum).
- 3) Apparent outflow area and possible retention pond southwest of Bldg 881 (see Appendix 2, #10 & 30). This area appears to have several outfalls from various sources flowing across it and a pond, see Fig. 2 of the Photo Report, may have been constructed and used in this area. At a minimum, concentration of rad and metals contamination may have occurred in this area.
- 4) Disturbed ground, possible disposal area, located in the southeast area of the IA, north of IHSS 119.1 (see Appendix 2, #16). This area is identified on Fig. 2, and appears to look different in Fig. 3 of the Photo Report, where it seems smoother, possibly filled in, and is located next to soil mounds. This area may have possible disposal concerns.

- 5) Disturbed ground southeast of the IA and immediately north of the former small arms range (see Appendix 2, #19 & 47). This area is identified on Fig. 3 of the Photo Report, and subsequent figures. This area was identified during the site visit as the area where disposal of excess cement has occurred. As an area with a history of disposal, the environmental condition of this area, the cement, and under the cement, is unknown.
- 6) Excavated/disturbed/filled area east of the IA (see Appendix 2, #8, 9, 20, & 48). Disturbed area, identified as "fill" initially identified on Fig. 3 of the Photo Report, east of the IA, located east of IHSS 111.3, in the area covered by IHSS 216.3 south of the east entrance road. This area appears to have been expanded, as seen on Fig. 5 of the Photo Report, to also include an area with "spoil", and excavations and "disturbed" ground, immediately east of the former small arms range. Although it is located in the area of IHSS 216.3, this activity predated the start of the East Spray Field activity. As such, the possible disposal activity in this area may not have been previously recognized nor investigated. This area may be a possible borrow and/or disposal area.
- 7) Large area of disturbed ground northwest of the IA, south of IHSS 114, west of IHSS 166.2 (see Appendix 2, #42). This may be associated with the landfill (IHSS 114). It is identified on Fig. 5 of the Photo Report as "fill", and on Fig. 6 as "disturbed ground". This area may be a possible disposal area.
- 8) Disturbed ground northwest of the IA, south of IHSS 114, east of IHSS 170 (see Appendix 2, #50). This area is identified on Fig. 6 of the Photo Report as trenches. This may be a possible disposal area.
- 9) Large area of disturbed ground northwest of the IA, southwest of IHSS 114, east of IHSS 170 (see Appendix 2, #54). Identified on Figures 7 through 10 & 13 of the Photo Report as "open storage", with an area of "standing liquid" identified on Fig. 10. Contamination may have been released in this area.
- 10) Disturbed area west of the IA, west of IHSS 170 (see Appendix 2, #53). This area is identified on Fig. 7 of the Photo Report as "disturbed ground", a "vent" is identified in this area on Fig. 8, "mounded material" on Fig. 9, and as a "probable oil burn facility" with "stains" on Fig. 10, 12, & 13. A surface inspection of this area indicated that there may have been a cement batch plant and related piles of material at this site rather than an oil disposal or burn area. However, this needs to be confirmed and properly evaluated. This area may have possible disposal concerns.
- 11) Small arms range northwest of the IA (see Appendix 2, #69). This should be identified as an IHSS or PAC, and it may need to be investigated and/or remediated when it is no longer in use. Potential contaminants of concern should include metals and possibly explosives and solvents.
- 12) A small retention pond located northeast of the IA, south of IHSS 142.1 (see Appendix 2, #74). This pond is first seen on Fig. 3 of the Photo Report. The source of the water for this pond appears to be the northeastern part of the IA, east of the Solar Ponds. Various contaminants may have accumulated in this pond. Concerns associated with this pond need to be evaluated.

13) Disturbed area south-southeast of the IA (see Appendix 2, #6), south of Woman Cr, and west of IHSS 209 consisting of several spots (5) as seen on Fig. 2 of the Photo Report. This may be related to a Tower that either was removed or was intended to be built at this location. This may not be related to disposal activities, nor have any environmental concerns, however, this needs to be evaluated, or documented.

14) Disturbed area located west of the IA (see Appendix 2, #7 & 39), north of IHSS 133.5, and north of the west entrance road. This may not be related to disposal activities, nor have any environmental concerns, however, this needs to be evaluated, or documented.

15) Disturbed area west of the IA (see Appendix 2, # 14). This is a small rectangular area on the north side of Walnut Creek, north of IHSS 168, as seen on Fig.1 & 2 of the Photo Report. This may be related to the ditch construction/operation and may not have any environmental/contamination concerns, however, this needs to be evaluated, or documented.

16) Elongated disturbed area (possible pipeline or ditch) on the east side of the IA (see Appendix 2, #15), running east-northeast from approximately IHSS 113, between IHSS 110/111 and IHSS 111.8/111.7 to the northeast along the top of the hillside south of South Walnut Creek. It also appears that this is an extension of older activity from the west. This may not be related to disposal activities, nor have any environmental concerns, however, this needs to be evaluated, or documented.

17) This appears to be a possible homesite, located southeast of the IA (see Appendix 2, #21), immediately northeast of IHSS 142.11. The structures appear to have been removed and this area modified during construction of the dam on Woman Creek. Due to the removal and alteration of this area, this is unlikely to be an area of concern, however, this should be appropriately evaluated, or evaluated, or documented.

18) This appears to be a possible homesite, located southeast of the IA (see Appendix 2, #22), south of IHSS 142.11. This is not identified in the HRR. The structures appear to have been cleared during construction of the dam on Woman Creek. This may not be an area of concern, however, this should be appropriately evaluated, or documented.

19) Possible Ash disposal pile southwest of the IA (see Appendix 2, #36), west of IHSS 133.5. This may also be a waste cement disposal area west of 133.5 and needs to be properly evaluated, or documented.

20) Numerous disturbed spots west and northwest of the IA (see Appendix 2, #31 & 40), north and east of IHSS 168. These numerous small disturbed spots may be prairie dog mounds, but an evaluation should be performed to make a proper determination, especially considering the apparent questionable historical knowledge concerning the presence of prairie dogs in this area.

- 21) Two areas of disturbed ground southwest of the IA (see Appendix 2, #37), west of IHSS 133.5, south of the raw water retention pond, south of the West Entrance Road. These areas may not be associated with any disposal activity, but this needs to be appropriately evaluated, or documented.
- 22) Large excavation west of the IA (see Appendix 2, #38), on the west side of the buffer zone, west of IHSS 168, north of the west entrance road. This apparent excavation may be related to gravel excavation activities rather than to any specific activity at Rocky Flats. As such, there may not be any environmental/contamination concerns. However, activities in this area need to be properly evaluated, or documented.
- 23) Possible waste disposal area west of the IA (see Appendix 2, #51), north of IHSS 168. Although this area is indicated to be a possible disposal site, a visual inspection of this area seems to support this site as a borrow area rather than a disposal site. However, this needs to be properly determined and environmental concerns evaluated as necessary.
- 24) Areas of possible fill north-northwest of the IA (see Appendix 2, #55), and north and west of IHSS 114. This appears to be related to the landfill and/or ditch construction, but this needs to be confirmed and documented, or properly evaluated for any environmental concerns.
- 25) Disturbed area north of the IA (see Appendix 2, #56) and north of the landfill retention pond. This disturbed area appears to be located between IHSS 167.1 and the Landfill Pond. This may be the borrow area for the landfill pond dam, but this needs to be determined and properly evaluated or documented.
- 26) Disturbed ground northeast of the IA (see Appendix 2, #57), north of Walnut Creek, north of IHSS 142.2. This may be a borrow site for dam construction, but this needs to be determined and properly evaluated or documented.
- 27) Disturbed ground northeast of the IA (see Appendix 2, #58), north of IHSS 142.3. This appears to be a borrow site for dam construction, but this needs to be determined and properly evaluated or documented.
- 28) Change in surface features/outfall locations to bypass the South Walnut Creek ponds east of the IA (see Appendix 2, #62). This change in the direction of flow from the diversion ditch appears to allow the water to flow farther to the east. The environmental concerns created by this change in the flow patterns, and the possible dissemination of contamination throughout the areas effected by this ditch, should be properly evaluated or documented.
- 29) Disturbance northwest of IA (see Appendix 2, #66). This appears to be a tower, and it does not appear to be related to any disposal activities. However, this needs to be confirmed and documented, or evaluations performed as necessary.

30) Disturbed ground north of parking lot on the north side of the IA (see Appendix 2, #72). The environmental impact of this may be negligible, however this needs to be determined and appropriate evaluations performed or documented.

The following areas of concern are IHSSs or PACs that appear to have a larger aerial extent or possible additional concerns than currently identified:

31) The disturbed ground, located immediately west-northwest of the IA (see Appendix 2, #2 & 52) appears to have been identified as **PAC 300-700**, the "Scrap Roofing Disposal Area". According to the HRR an investigation of this area found scrap roofing material, asphalt, styrofoam, and plastic sheeting, which was removed and placed in the sanitary landfill. The HRR indicates that monitoring of the material and the trench did not detect radioactivity. Other than monitoring for radioactivity, no sampling or analysis for other analytes is indicated to have occurred. This area initially contained two large excavated areas. It is not clear in the HRR if both were investigated, although both were eventually filled and may have been utilized as possible disposal sites. A visual inspection of this area did not identify any specific evidence of debris or waste. This area appears to have been filled, leveled and gently sloped to the north into Walnut Creek. Paved and dirt/gravel roads, as well as general storage/parking areas have been placed on top of parts of this area. This is also the general area of soil mounds (see Appendix 2, #61), which may be construction soil, that may have been spread on this area. Additional evaluation/investigation of this area may need to be performed.

32) Possible waste disposal area west-southwest of the IA (see Appendix 2, #3), south of the west entrance road, north and in the general area of **IHSSs 133.6, 133.4, 133.1, 133.3, & 133.5**. The currently identified IHSSs appear to identify specific areas within this disturbed area. This may not be a new IHSS, however this needs to be evaluated with the adjacent IHSSs.

33) Possible waste disposal areas southwest of the IA (see Appendix 2, #24, 25, & 26), in the area of the **133 IHSSs**. Possible additional disposal/ash areas between 133.5 and 133.6, immediately north of 133.1, and south of 133.3. These apparent waste disposal areas may be currently identified as IHSSs but the exact locations are difficult to determine. These may or may not be new IHSSs, however, an appropriate evaluation needs to be performed.

34) Disturbed area southeast of the IA and south of Woman Creek (see Appendix 2, #5). Identified as **IHSS 209** in the HRR but covers a larger area than IHSS 209. IHSS 209 appears to only be the north half of this area. This area should be included in IHSS 209. Further evaluation of this area may need to be performed.

35) Pipelines and East Spray areas, east of the IA (see Appendix 2, #63). These activities and areas are identified as **IHSS 216.2 and 216.3**. However, it does not appear that all of the East Spray areas are included in these IHSSs as identified in the HRR. There appears to be an area, as identified on Fig. 8, north of the East Access Road and east of 216.2 that is not identified as part of the East Spray Field IHSS -216. This area needs to be included as a part of this IHSS, and evaluated as necessary.

36) Disturbed area west of the IA (see Appendix 2, #67). This appears to be an area of fill located within the area of **PAC 100-604**, but is not specifically identified in the HRR. The source and potential impact of this fill should be determined.

Conclusion

This Buffer Zone Study identified thirty additional areas that may have possible environmental concerns, and 6 currently identified areas that may have additional concerns. All 36 areas need to be properly reviewed and the relevant concerns evaluated for possible modifications to current IHSSs or identification as new IHSSs or PACs, or proper documentation provided showing that no concerns exist.

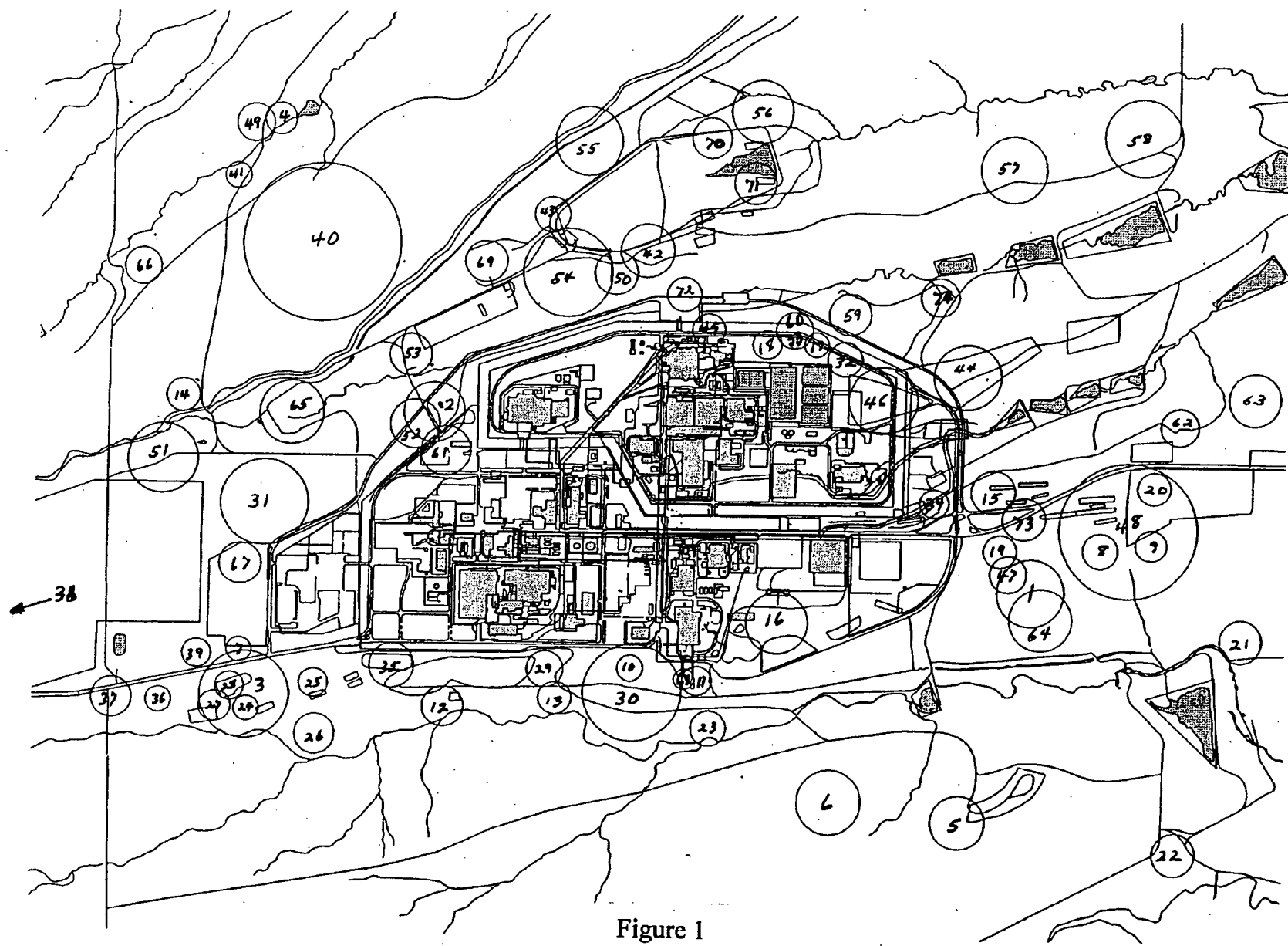


Figure 1
Areas of Interest

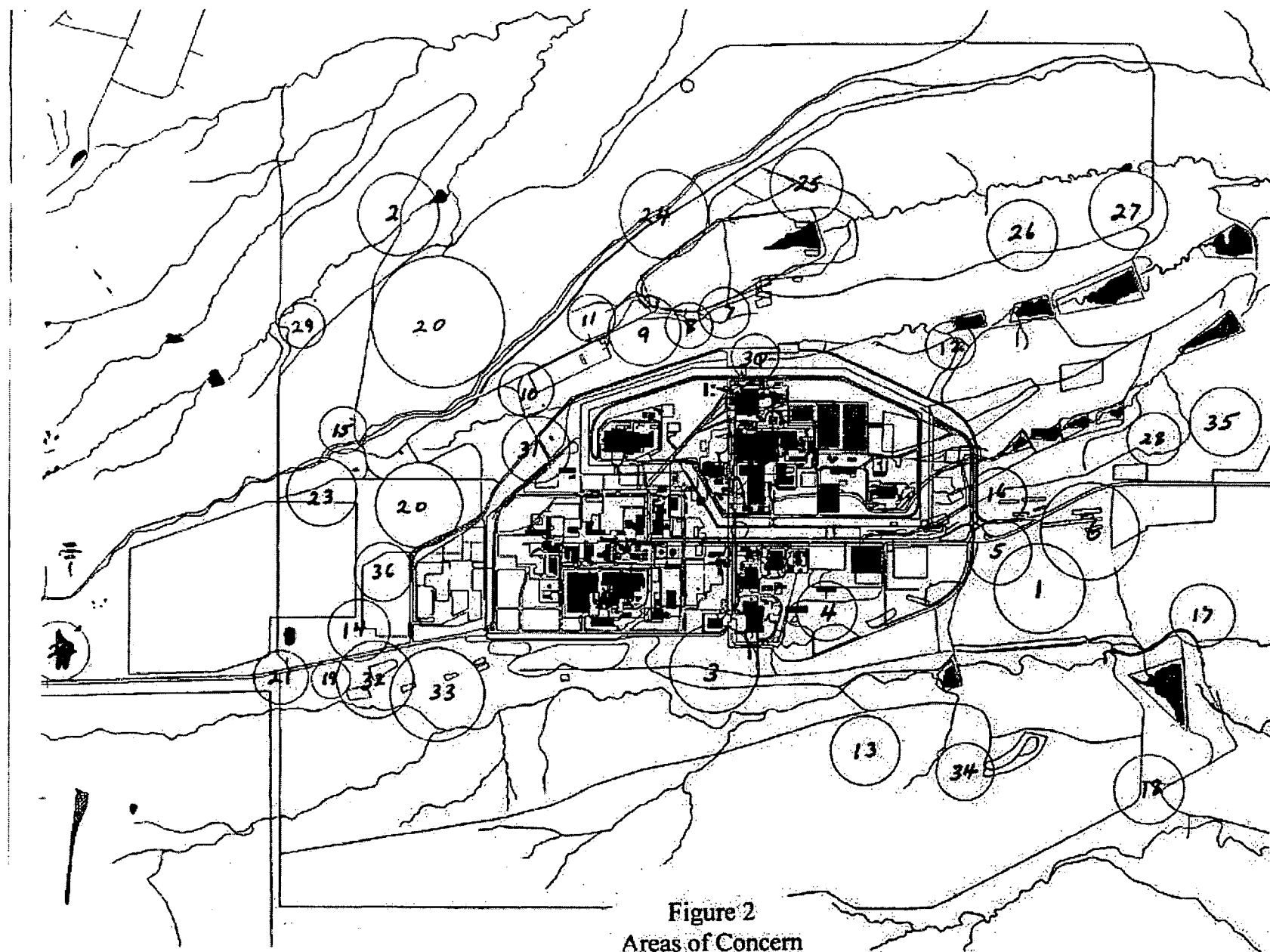


Figure 2
Areas of Concern

APPENDIX 1

List of Rocky Flats Buffer Zone Documents Reviewed

Aerial Photographic Analysis Comparison Report, US DOE, Rocky Flats, Appendix A, EPA Document TS-PIC-88760, July 1988, Environmental Monitoring Systems Laboratory, P.O. Box 93478, Las Vegas, NV 89193-3478

Aerial Photographic Analysis Comparison Report (written report), Helmstadt - Lockheed Engineering and Sciences Company, Las Vegas, Nevada, July 1988

Annual Update for the Historical Release Report, RMRS, September 1998, Revision 0

Colorado Federal District Court, Report of the Special Grand Jury 89-2, February 19, 1992

Final Historical Release Report for the Rocky Flats Plant, DOE, June 1992

Health Studies on Rocky Flats, Phases 1 & 2, Briefing Book 33: October 1998

Releases from Rocky Flats, ChemRisk for CDH, September 1994

Reporters Transcript, Sentencing Hearing for Rockwell International, June 1, 1992

Task 2 Report, Selection of the Chemicals and Radionuclides of Concern, ChemRisk Division-Mclaren/Hart for CDH, June 1991

Tasks 3 & 4 Report, Reconstruction of Historical Rocky Flats Operations & Identification of Release Points, ChemRisk for CDH, August 1992

Task 5 Report, Estimating Historical Emissions from Rocky Flats 1952-1989, ChemRisk for CDH, March 1994

Task 6 Report, Exposure Pathway Identification & Transport Modeling, ChemRisk for CDH, May 1994

Task 7 Report, Demographic & Land Use Reconstruction of the Area Surrounding the Rocky Flats Plant, ChemRisk for CDH, April 1994

Task 8 Report, Dose Assessment for Historical Contaminant Releases from Rocky Flats, ChemRisk for CDH, September 1994

US Supplemental Response to Order Regarding Motion for Release of Grand Jury Documents, Jan 26, 1993

Waste Management Units: RCRA - Regulated Hazardous and Radioactive Mixed Waste Units, Solid Waste Units, and CERCLA Areas, December 15, 1987

APPENDIX 2

Results of documents reviewed for the Buffer Zone Study

Report of Grand Jury 89-2, Feb 19, 1992 - Did not indicate any additional areas of contamination other than those already identified. However it did discuss the following:

- 1) Identified burning of hazardous waste in Bldg 771 which may have generated and released dioxins to the environment.
- 2) Identified the release of chromic acid and possibly non- treated sewage into pond B-3 and possibly to the east spray field. The runoff from the east spray field went directly into ponds B-4 and B-5.
- 3) Indicated the storage of liquid salt brine, with pH of 12.5 +, in Pond 207C.
- 4) Indicated that pondcrete and saltcrete were stored outside at the 750 and 904 pads. Pondcrete and saltcrete spilled and ran into ponds B-1, B-4 and B-5, and was dispersed by winds.
- 5) Effluent from the east spray field ran off into ponds B-4, B-5 and C-2, with some running off into Walnut and Woman Creek drainages downstream of these ponds.
- 6) Spray irrigation occurred over the East Trenches, flushing contamination into the groundwater.

Reporters Transcript, Sentencing Hearing for Rockwell International, June 1, 1992 - no relevant info

US Supplemental Response to Order Regarding Motion for Release of Grand Jury Documents, Jan 26, 1993 - no relevant info

Aerial Photographic Analysis Comparison Report, DOE, Rocky Flats, Appendix A, EPA Region 8, July 1988 -

Figure 1, Frame #6230, Pic #88760, Sept 21, 1953 -

Appears to be an abandoned RR grade going to NW from Plant site

- 1) Disturbed ground identified east-se of IHSS 155 & south of 111.8 & 111.7
- 2) Disturbed ground due w-nw of Plant site
- 3) Possible Waste disposal area W-SW of Plant site, south of main road, north and adjacent to IHSS's 133.6, 133.4, 133.1, 133.3, & 133.5.
- 4) Disturbed ground nw of Plant site, homesite?

Figure 2, Frame #2N-88, Pic #88760, July 2, 1955 -

- 1) Appears to be larger with distinct road pattern
- 4) Area appears to have expanded with discrete roads and possible trench
- 5) Disturbed area se of Plant site & south of Woman Cr, poss. IHSS 209?
- 6) Disturbed area s-se of Plant site & south of Woman Cr, poss wells? Or small trenches? Several spots (5), poss. tower?
- 7) Disturbed ground north of 3) & north of road
- 8) Small disturbed area east of 1)
- 9) small disturbed area east of 8)
- 10) Outflow pond south of Bldg 881
- 11) Outflow pond sw of Bldg 881
- 12) Retention pond south of IHSS 115
- 13) Disturbed area south of Plant site sw of bend in road (part of IHSS 115)
- 14) Disturbed area west of Plant site, small rectangular area on n side of walnut Cr

15)Poss pipeline/sewer line east side of Plant site, runs e-ne from IHSS 113, between 110/111 and 111.8/111.7

16)Disturbed ground se area of Plant site, north of IHSS 119.1 (trench or pond)

17)Disturbed ground north side of S Ponds

18)Stained ground north side of S Ponds

73)Trench north of 1), south of IHSS 111.8

Figure 3, Frame #3-7, Pic #88760, Oct 15, 1964 -

Numerous surface traces of poss. Pipelines/fire breaks/ roads? are seen in buffer zone

5)Several Trenches are visible in this area

8)Disturbed area identified as a trench

19)Disturbed ground north of 1)

20)Disturbed "fill" area east of Plant site, poss. part of IHSS 216.3

21)Homesite? SE of Plant site

22)Homesite? SE of Plant site and south of 21)

23)Retention pond SE of Bldg 881 & north of Woman Cr

24)Waste disposal area between 133.5 and 133.6

25)Poss. Ash disposal area north of 133.3

26)Disturbed area (poss. disposal area) south of IHSS 133.3

27)Ash disposal area west of IHSS 133.6

28)Incinerator located north of IHSS 133.5

29)Waste disposal site east side of IHSS 115

30)Outfall area west of building 881

31)Numerous disturbed spots west of Plant site, north and east of IHSS 168, may be natural rather than man made, prairie dog homes?

32)Disturbed ground NE of S Ponds

33)Stained area north of S Ponds

34)Disturbed area NE of IHSS 113

74)Small pond south of IHSS 142.1

Figure 4, Frame #163, Pic #88760, Aug 7, 1969 -

35)Disturbed ground east of 133.2

36)Possible Ash disposal pit west of IHSS 133.5

37)Two areas of disturbed ground west of 36)

38)Large excavation on west side of buffer zone, prob. not related to RF activity

39)Poss. drum storage area on north side of road

40)Numerous disturbed spots NW of Plant site similar to those identified in 31)

41)Disturbed area NW of Plant site, SW of 4)

Figure 5, Frame #154, Pic #88760, Aug 7, 1969 -

1)Described as the small arms range - under construction, so what has it been?

2)Reworked area, mounded soil

42)Large area of "fill" south of IHSS 114

43)Disturbed ground west of IHSS 114

44)Disturbed ground/soil mound/excavation covering a larger area than IHSS 156.2

45)Soil mounds on the north edge of the Plant site

46)Open storage (drums) larger area than IHSS 165, includes 32)

47)Disturbed ground north of 1) & in area of 19)

48)Excavated/disturbed/filled area includes 8) and 9)

Figure 6, Frame #2-88, Pic #88760, Aug 6, 1971 -

- 36) Identified as poss. burn area
- 40) Appear to be new paths/roads into this area
- 48) Most of this area appears to have been filled in
- 49) Disturbed area with road to it, SW of 4)
- 50) Trenches in and next to disturbed ground south of IHSS 114 and west of 42)

Figure 7, Frame #3-179, Pic #88760, Aug 17, 1978 -

Appear to have built new pipeline from C-1 pond on Woman Cr up to se Plant site through IHSS 140

- 5) Appear to be additional activity
- 35) Area south of IHSS 115 appears to extend south to woman Cr
- 51) Poss. waste disposal area west of the Plant site, north of IHSS 168
- 52) Parking lot built on south part of 2)
- 53) Disturbed area west of IHSS 170
- 54) Open space storage, includes 50)
- 55) Areas of "fill" north & west of IHSS 114
- 56) Disturbed area north of landfill retention pond, could be IHSS 167.1
- 57) Disturbed ground NE of Plant site north of Walnut Cr
- 58) Disturbed ground east of 57)
- 59) Disturbed ground NE of S Ponds, poss. leachate
- 60) Area north of S ponds, poss. leachate, includes 33)
- 61) Soil mounds on the west side of the Plant site
- 62) Change in surface features/outfall locations to bypass the South Walnut Cr ponds

Figure 8, Frame #67, Pic #88760, June 1, 1980 -

Built diversion ditch north of Woman Cr and C-2 Pond, Also built lowest dams on Walnut and South Walnut Crs, Also removed 21) & 22), with 22) becoming a construction storage area

- 53) New construction activities and a "Vent" is identified
- 63) Put in pipelines and East Spray areas, with most of the runoff appearing to go to Woman Cr
- 64) Area south of 1) appears to be disturbed or modified
- 65) Drainage way construction and disturbed area NW of Plant site, NE of 51), disturbed ground is identified as a part of the construction activities and not related to any disposal activities

Figure 9, Frame #483-26, Pic #88760, Oct 5, 1983 -

Wet ground to the west of the Plant site, West spray field, and a cleared area on the west side of the plant site

- 35) An oval track has been built on part of this area
- 51) additional possible disposal activity
- 66) Disturbance NW of Plant site, poss. tower

Figure 10, Frame #43, Pic #88760, May 22, 1986 -

- 53) Appears to have an oil burn facility and stains
- 54) Standing liquid in the east end of the open storage area and the area has expanded to the south
- 67) Appears to be an area with "fill"
- 68) 3 sludge retention ponds south of Bldg 881
- 69) Small arms range NW of Plant site
- 70) Area with poss. disposal activity east of IHSS 114
- 71) Spray area south of landfill pond

Figure 11, Frame #40, Pic #88760, May 22, 1986 -

Pipeline installed from east spray field area 48) to South Walnut Cr ponds 142.7 and 142.8

1) Small arms range supposedly being dismantled

Figure 12, Frame 46, Pic #88760, May 22, 1986 -

Shows west spray field and runoff

Figure 13, Frame 005, Pic 88760, June 7, 1988 -

Shows a newly constructed drainage ditch on the east from entrance road to C-2, also the Radio Transmitter is in place, and shows the spray fields on both the south and north sides of the landfill pond

1) The small arms range appear to still be there

72) Disturbed ground north of parking lot on north side of Plant site

Aerial Photographic Analysis Comparison Report (written report), Helmstadt - Lockheed Engineering and Sciences Company, Las Vegas, Nevada, July 1988 - Very brief discussion of the photos.

Waste Management Units: RCRA - Regulated Hazardous and Radioactive Mixed Waste Units, Solid Waste Units, and CERCLA Areas, December 15, 1987 - Brief discussion of the proposed SWMUs at Rocky Flats, no additional information or sites.

Final Historical Release Report for the Rocky Flats Plant, DOE, June 1992 - Only discussed a few of the possible new areas of concern identified from the areal photos. The following appear to be the only areas discussed in the 92HRR:

The newly identified area 2) may have been described as **PAC 300-700**, The Scrap Roofing Disposal Unit, Operated between 1955 - 1981. Identified as an old burial trench 500 yards NW of Bldg. 371. Roofing material, styrofoam, asphalt and plastic sheeting was found and removed in 1981. No detection of radioactivity was found during monitoring. The material was placed in the sanitary landfill. Since there were two excavated areas identified in this area 2), it is not known which of these two areas is possibly identified as PAC 300-700. Nor was it determined if any releases to the environment had occurred at PAC 300-700.

Identified **PAC 300-702**, The Pesticide Shed (Bldg. 367), located west of Bldg. 371 outside the PA, but inside the IA. Numerous spills appeared to have occurred. In 1988 the unused chemicals were disposed in an unknown location, and the area around the bldg was cleaned up. Although soil sampling was supposed to have occurred, no documentation was found that samples were ever collected or analyzed. This may possibly be another new area of concern previously not identified as an IHSS. Other than this PAC, no attempt has been made to determine if other potential IHSS's may exist, or if other PAC's mentioned in this document may have been overlooked.

PAC SE-1601.2 appears to be 23), and is described as Pond 8-South. Operated prior to Oct 1964 to mid 1970s. Received cooling tower overflow/blowdown as well as flow from Bldg. 881 footing drains. Cooling tower effluent contained chromium-based biocides. No documentation of sampling or remediation. PAC SE-1601.1, which appears to be 11) is also described as Pond 8-North and is described similar to 23).

PAC SE-1600 appears to be part of 68), and is described as Pond 7. Operated from March 1955 to prior to Oct 1964. Received steam condensate and other discharges from Bldg. 881, including sanitary sewage, and possibly process waste. Limited sampling may have been conducted in 1971 indicating that some radioactivity existed. No documentation of remediation.

PAC SE-209 is part of 5). 5) appears to be larger than the area indicated to include IHSS 209.

This area is identified as a borrow area, not a disposal area.

It is unclear but it appears that the 133 IHSS's may possibly be equivalent to some of 3), 24), 25), 27), & 28). The precise locations seem to be different but the descriptions of the activity seem to correlate. However, it does not appear that 26) or 36) have been identified as 133 IHSSs.

Although, 36) may also be concrete washed out of trucks as described for IHSS 133.6.

PAC SW-196 (IHSS 196) is 12). This is described as the plant burning pit and the evaporation/settling pond for the backwash water from the water treatment plant, either waste water or raw water.

PAC NE-167.3 (IHSS 167.3) is 71). This is the South Landfill Pond Spray Field.

PAC NE-216.2 and 216.3 (IHSS 216.2 & .3) is a part of 63). Additional areas of 63) are located north east of 216.2. The western part of 216.3 also appears to be located over 20) and 48), but the activities in 216.3 do not seem to be related to the possible activities related to 20) and 48). 216.2 and 216.3 are identified as the East Spray Fields.

Two other PACs that were not previously identified in the photos but are discussed in the 92HRR are; PAC NW-195 and PAC NE-1400. NW-195 is identified as the Nickel Carbonyl Disposal site, where nickel carbonyl gas was released in a dry well in 1972 and at least two potentially empty cylinders remain buried in the well. The exact location of NW-195 is uncertain, except that it is indicated to be somewhere north or northwest of the landfill. NE-1400 is identified as the Tear Gas Powder Release site, where 5 lbs of CS tear gas powder was dumped on the buffer zone roadway northeast of the landfill on Aug 5, 1987. The area was hosed down with water but no sampling or other actions are known to have occurred. It is indicated in the 98HRR that both NW-195 & NE-1400 have been approved for NFA by the EPA.

Task 2 Report, Selection of the Chemicals and Radionuclides of Concern, ChemRisk Division-Mclaren/Hart for CDH, June 1991 - did not provide any information regarding possible additional release sites.

Tasks 3 & 4 Report, Reconstruction of Historical Rocky Flats Operations & Identification of Release Points, ChemRisk for CDH, August 1992 - Identified several waste disposal sites, especially inside the IA, but did not identify any new sites or activities in the Buffer Zone, outside the IA, that were not already identified. Extensive references were reviewed during the generation of this document. These references include personnel interviews, personal communications, court records and testimony, as well as documents pertaining to accidents, releases, and disposal activities.

Task 5 Report, Estimating Historical Emissions from Rocky Flats 1952-1989, ChemRisk for CDH, March 1994 - did not provide any information regarding possible additional release sites.

Task 6 Report, Exposure Pathway Identification & Transport Modeling, ChemRisk for CDH, May 1994 - did not provide any information regarding possible additional release sites.

Task 7 Report, Demographic & Land Use Reconstruction of the Area Surrounding the Rocky Flats Plant, ChemRisk for CDH, April 1994 - did not provide any information regarding possible additional release sites.

Task 8 Report, Dose Assessment for Historical Contaminant Releases from Rocky Flats, ChemRisk for CDH, September 1994 - did not provide any information regarding possible additional release sites.

Health Studies on Rocky Flats, Phases 1 & 2, Briefing Book 33: October 1998 - did not contain specific information regarding possible sites of releases, but contained additional possible references.

1998 Historical Release Report - Reviewed the Plates showing the locations of the IHSSs and PACs, and the brief descriptions of specific areas of concern. This review indicated the following areas identified in the Aerial Photographic Analysis Comparison Report appear to be identified as PACs or IHSSs:

- #2 - PAC 300-700
- #5 - IHSS 209
- #11 - PAC SE-1601.1 & IHSS 102
- #12 - IHSS SW-196 part of IHSS 115
- #13 - part of IHSS 115
- #17 - part of IHSS 101
- #18 - part of IHSS 101
- #20 - located in area of IHSS 216.3
- #23 - PAC SE-1601.2
- #26 - may be IHSS 133.3
- #27 - IHSS 133.6 &/or PAC SW-1701
- #28 - IHSS 133.5
- #29 - part of IHSS 115
- #32 - part of IHSS 101
- #33 - part of IHSS 101
- #34 - part of IHSS 113
- #35 - part of IHSS 115
- #43 - part of IHSS 114
- #44 - IHSS 156.2
- #45 - part of several IHSSs
- #46 - IHSS 165
- #52 - PAC 300-700
- #59 - was part of PAC 000-101 (1992HRR) but is now outside IHSS 101
- #60 - part of IHSS 101
- #63 - partly covered by IHSS 216.2 and 216.3
- #67 - PAC 100-604
- #68 - IHSSs 102, 106, & 107
- #70 - part of IHSS 114
- #71 - IHSS 167.3
- #73 - PAC NE-1413

APPENDIX 3

Field/Visual Notes (2/25/99)

Attendees: David Kruchek, Carl Spring, Tom Greengard, Nick Demos, Norma Castaneda, and Scott Surovchak

Visually drove by and/or walked around the following sites (see Figure 1): the old small arms range (1), the disturbed area (47), the disturbed & fill areas (20 & 48), the disturbed/disposal area (2 & 52), the oil burn area (53), the disposal area (51), and the disturbed area (31)

The following observations were made:

(1) The old small arms range was littered with junk/trash, used range equipment, and shell casings. Nick said that both the North and East embankments were used for target practice, and would contain bullets. Old metal target frames were seen to the south toward Woman Creek at various distances from the range. Nick said that these targets were used and that weapons were fired to the south, toward woman Creek and the opposite hillside. Although the area appeared to have been reshaped to support the range activities, no specific evidence of burial activity was noted. Also no specific ground stains were identified.

(47) This area appears to be what Tom called the excess cement dump site. Tom indicated that excess cement was dumped down the hillside just north of the small arms range. It appeared that numerous events of cement dumping had occurred, as various layers and colors of cement were visible.

(20 & 48) This area appears to have been filled and leveled toward the south with a distinct rounded edge to the south, however no visual waste was evident, so the composition of the fill material is unknown.

(2 & 52) This area has been filled, leveled and gently sloped to the north into Walnut Creek. Paved and dirt/gravel roads, as well as general storage/parking areas have been placed on top of parts of this area. No specific evidence of debris/waste were seen.

(53) This area was identified by Tom and Scott as probably a cement batch plant, not an oil burner. A cement foundation, and supports were seen, as well as small asphalt and rock piles. No specific stained soil was identified.

(51) This area appears to be a barrow area rather than a disposal area. The only debris that was seen was an old metal culvert and diverter lying on the surface of the ground.

(31) The anomalies seen in the aerial photos could not be determined on the ground. No specific evidence of burial/disposal activity were identified.